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18 **BEFORE THE ARIZONA CORPORATION COMMISSION**

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21 LEA MÁRQUEZ PETERSON
22 ANNA TOVAR
23 KEVIN THOMPSON
24 NICK MYERS

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DOCKET NO. E-01933A-22-0107

**ARIZONA SOLAR ENERGY
INDUSTRIES ASSOCIATION'S AND
SOLAR ENERGY INDUSTRIES
ASSOCIATION'S DIRECT
TESTIMONY ON ISSUES OTHER
THAN RATE DESIGN**

DIRECT TESTIMONY OF KARL R. RÁBAGO

ARIZONA SOLAR ENERGY INDUSTRIES ASSOCIATION'S AND SOLAR ENERGY INDUSTRIES
ASSOCIATION'S DIRECT TESTIMONY ON ISSUES OTHER THAN RATE DESIGN

RESPECTFULLY SUBMITTED this 11th day of January, 2023.

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ARIZONA SOLAR ENERGY INDUSTRIES ASSOCIATION'S AND SOLAR ENERGY INDUSTRIES
ASSOCIATION'S DIRECT TESTIMONY ON ISSUES OTHER THAN RATE DESIGN

BEFORE THE ARIZONA CORPORATION COMMISSION

COMMISSIONERS

JIM O'CONNOR CHAIR
LEA MÁRQUEZ PETERSON
ANNA TOVAR
KEVIN THOMPSON
NICK MYERS

IN THE MATTER OF THE APPLICATION OF)
TUCSON ELECTRIC POWER COMPANY FOR)
THE ESTABLISHMENT OF JUST AND)
REASONABLE RATES AND CHARGES)
DESIGNED TO REALIZE A REASONABLE)
RATE OF RETURN ON THE FAIR VALUE OF)
THE PROPERTIES OF TUCSON ELECTRIC)
POWER COMPANY DEVOTED TO ITS)
OPERATIONS THROUGHOUT THE STATE OF)
ARIZONA AND FOR RELATED APPROVALS)

DOCKET NO. E-01933A-22-0107

DIRECT TESTIMONY OF

KARL R. RÁBAGO

ON BEHALF OF

ARIZONA SOLAR ENERGY INDUSTRIES ASSOCIATION (ARISEIA) AND

SOLAR ENERGY INDUSTRIES ASSOCIATION (SEIA)

ON ALLOWED RETURN ON EQUITY

Filed: January 11, 2023

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I. INTRODUCTION & WITNESS QUALIFICATIONS

Q. Please state your name, business name and address, and role in this matter.

A. My name is Karl R. Rábago. I am the principal of Rábago Energy LLC, a Colorado limited liability company, located at 2025 E. 24th Avenue, Denver, Colorado. I appear here in my capacity as an expert witness on behalf of the Arizona Solar Energy Industries Association (ARISEIA) and the Solar Energy Industries Association (SEIA).

Q. Please summarize your experience and expertise in the field of electric utility regulation.

A. I have worked for more than 32 years in the electricity industry and related fields. I am actively involved in a wide range of electric utility issues across the United States. My previous employment experience includes Commissioner with the Public Utility Commission of Texas, Deputy Assistant Secretary with the U.S. Department of Energy, Vice President with Austin Energy, Executive Director of the Pace Energy and Climate Center, Managing Director with the Rocky Mountain Institute, and Director with AES Corporation, among others. A detailed resume is attached as Exhibit KRR-1.

Q. Do you have any specific experience relating to rate making and rate design?

A. Yes. As a public utility commissioner for the Public Utility Commission of Texas, I reviewed and made decisions about hundreds of rate applications by investor-owned, cooperative, and publicly owned electric and telephone utilities. As an electricity sector executive, I led or advised in the design of rate designs of many types and have proposed and overseen application of rates for a variety of services. As a law professor, I have taught the principles of rate making to law students. As an expert witness, I have reviewed and testified in regulatory commission proceedings on the merits of scores of rate proposals

1 from investor-owned, cooperative, and publicly owned electric utilities. I have written and
2 published articles on rate design, especially as it relates to distributed energy resources.

3 **Q. Do you have specific experience relating to utility rate of return and return on equity**
4 **issues?**

5 A. Yes. I have reviewed, made regulatory decisions on, and testified on many utility
6 applications for approval of allowed return on equity and rate of return. In addition, I have
7 participated in several proceedings relating to performance incentive metrics impacting
8 rate of return.

9 **Q. Have you ever testified before the Arizona Corporation Commission or other**
10 **regulatory agencies?**

11 A. This is the first time I have submitted formal testimony before the Arizona Corporation
12 Commission (“Commission”). In the past ten years, I have submitted testimony, comments,
13 or presentations in regulatory and policy proceedings in Alabama, Arkansas, Arizona,
14 California, Colorado, Connecticut, the District of Columbia, Florida, Georgia, Guam,
15 Hawaii, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Massachusetts, Michigan,
16 Minnesota, Mississippi, Missouri, Nevada, New Hampshire, New York, North Carolina,
17 Ohio, Pennsylvania, Puerto Rico, Rhode Island, Texas, Vermont, Virginia, Washington,
18 and Wisconsin. I have also testified before the U.S. Congress and have been a participant
19 in comments and briefs filed at several federal agencies and courts. A listing of my previous
20 testimony is attached as Exhibit KRR-2.

21 **II. OVERVIEW OF TESTIMONY AND RECOMMENDATIONS**

22 **Q. What is the purpose of this testimony?**

1 A. In this testimony, I address the proposals by the Tucson Electric Power Company
2 (Company) related to allowed return on equity (ROE) of 10.25%, overall rate of return
3 (ROR) or weighted average cost of capital (WACC), and equity to debt ratio or capital
4 structure. I review the testimony and information offered by the Company, primarily
5 sponsored by Company witnesses Martha B. Pritz, Senior Director of Finance and
6 Treasurer, and Ann E. Bulkley, Consultant, and take issue with several arguments the
7 Company offers in support of its proposed return and capital structure.

8 **Q. What are the Company's ROE and capital structure proposals?**

9 A. The Company requests that the Commission approve an allowed return on equity (ROE)
10 of 10.25%, and, after incorporating a 3.82% cost of debt, an overall rate of return (ROR)
11 or weighted average cost of capital (WACC) of 7.31%, based on an equity to debt ratio of
12 54.32% equity to 45.38% debt.

13 **Q. Are the Company's ROE and capital structure proposals reasonable?**

14 A. No, and for several reasons. First, the Company fails to recognize the financial hardship
15 the proposed increases in profits and unnecessary costs would impose on customers.
16 Second, the Company has not made a showing that the proposed increases to rates that
17 would result from its proposals are necessary. The Company instead relies on averaging
18 methods that ignore the risk reductions appreciated by the Company. Third, the Company
19 relies on arguments about Arizona Public Service's rate case that are fundamentally
20 irrelevant to the decision about an appropriate return for the Company. Fourth, the
21 Company ignores the substantial reduction in its financial risk that will follow from its
22 transition away from coal and gas, and toward renewable fuels, and that the average returns

1 for other utilities pursuing clean energy goals are substantially lower than those for fossil
2 energy-dependent utilities.

3 **Q. Please summarize your findings on these issues.**

4 A. I find that the Company has failed to justify its proposal for an ROE of 10.25% and an
5 equity to debt ratio of 54.32% equity to 45.38% debt. The Company's proposal would
6 impose significant unjustified additional costs on customers solely to enrich shareholders,
7 and result in rates for electric service that are neither just nor reasonable.

8 **Q. What recommendations to you make to the Commission based on your review of the**
9 **evidence in this case?**

10 A. I make two recommendations to the Commission. First, I recommend that the Commission
11 reject the Company's proposal to establish the allowed ROE at 10.25%, and to instead
12 award an ROE no higher than the Company's current authorized ROE of 9.15%. Second,
13 I recommend that the Commission reject the Company's proposal to increase the equity to
14 debt ratio to 54.32% equity to 45.38% debt, and instead to authorize an equity ratio of
15 52.95% equity to 46.92% debt.

16 **III. THE COST AND RATES IMPACTS OF THE COMPANY'S ROE AND CAPITAL**
17 **STRUCTURE PROPOSALS**

18 **Q. What are the key metrics of the Company's ROE and capital structure proposals?**

19 A. The Company proposes to increase its allowed ROE by 110 basis points¹ and to increase
20 the equity fraction in its equity ratio by 137 basis points.² The proposed increase in the
21 ROE is a proposal to increase profit on Company spending, which also increases the

¹ Calculated as 10.25% - 9.15% = 1.10% = 110 basis points.

² Calculated as 54.32% - 52.95% = 1.37% = 137 basis points.

incentive to the Company to spend more money. The proposed increase in the equity fraction would further increase profit by increasing the reliance on equity as compared to debt, which is about one-half as expensive as equity, in overall capital structure.

Q. Can the impact of these proposals be quantified in terms of revenue requirement and rates?

A. Yes. According to the Company's estimates,³ each basis point increase in the ROE means an increase in revenue requirement of about \$263,000, and an increase in residential and small commercial customer rates of about 0.0951%. Each one basis point increase in the equity fraction of the capital structure means an increase in the revenue requirement of about \$36,000, and an increase in residential and small commercial rates of about 0.0129%. Taken together, the proposed ROE and equity fraction increases account for a proposed increase of nearly \$34 million in revenue requirement, or about 25 percent of the total revenue requirement proposed in this case.⁴

Table KRR-1: Revenue Requirement Impact of ROE and Capital Structure Proposals

	Proposed Basis Point Increase	Revenue Requirement Increase for 1 Basis Point	Proposed Revenue Requirement Increase
ROE	110	\$263,000	\$28,930,000
Equity Fraction	137	\$36,000	\$4,932,000
Total Proposed Revenue Requirement Increase			\$136,000,000
ROE & Equity Fraction Increase			\$33,862,000
ROE & Equity Fraction Increase (%)			25%

Q. Can these impacts be quantified in terms of rates for residential customers?

³ Company response to ARISEIA 2.3. Company responses are attached as Exhibit KRR-3.

⁴ Company Application at p. 2, Table 1.

A. Yes. The Company proposes to increase residential rates by nearly 25% for usage up to 1,000 kilowatt-hours (kWh), and by more than 27% for usage above 1,000 kWh.⁵ The proposed increases in the ROE and equity fraction account for 40% of those increases. If the ROE and equity fraction were not increased as proposed by the Company, the increases in the residential rates would be reduced to 14.1% for usage up to 1,000 kWh, and to 16.6% for usage above that level.⁶

Table KRR-2: Company Proposed Residential Rate Increases, and Changes if Increases to ROE and Equity Fraction are Excluded

	Current Residential Rates	Proposed Residential Rates	Proposed Rate Increase	Proposed Rate Increase (%)
0-500 kWh	\$0.0761	\$0.0948	\$0.0187	24.6%
501-1000 kWh	\$0.0934	\$0.1163	\$0.0230	24.6%
Over 1000 kWh	\$0.0977	\$0.1242	\$0.0265	27.1%

	Current Residential Rates	Residential Rates Increases Proposal Excluding Increases due to ROE & Equity Fraction	Residential Rates Increases Proposed Excluding Increases due to ROE & Equity Fraction	Proposed Rate Increase (%)
0-500 kWh	\$0.0761	\$0.0868	\$0.0107	14.1%
501-1000 kWh	\$0.0934	\$0.1065	\$0.0132	14.1%
Over 1000 kWh	\$0.0977	\$0.1140	\$0.0162	16.6%

Q. What do you conclude from this analysis using Company data and estimates?

A. The Company's proposals to increase the allowed ROE and the equity fraction in the capital structure will impose significant financial burdens on customers. The Company proposal to increase rates by about 25% for residential customers is significantly greater than inflation since the Company's rates were last approved, which ran to about 14% over the period January 2021 to November 2022.⁷ Even assuming that all the other revenue

⁵ Company Exh. RDB-4, at Sheet No. 101-1.

⁶ Calculated as proposed rate increases minus rate impacts of ROE and equity fraction changes.

⁷ U.S. Bureau of Labor Statistics CPI Inflation Calculator, available at: https://www.bls.gov/data/inflation_calculator.htm.

1 requirement increases proposed by the Company were reasonable, the added profits the
2 Company seeks for its shareholders make the ROE and capital structure proposals
3 unreasonable on their face.

4 **IV. DEFICIENCIES IN THE COMPANY'S BASIS FOR REQUESTING THE**
5 **INCREASES IN THE ROE AND EQUITY FRACTION OF THE CAPITAL STRUCTURE**

6 **Q. What issues do you have with the Company's arguments for increasing the ROE by**
7 **110 basis points and increasing the equity fraction by 137 basis points?**

8 A. There are key flaws in the justifications offered by the Company for the proposed ROE and
9 capital structure changes. First, Company witnesses Pritz and Bulkley stress the need for
10 an allowed ROE and ROR that is sufficient to attract capital, the need for revenue recovery
11 mechanisms that help mitigate any adverse impacts of regulatory lag, and the benefits of a
12 constructive regulatory environment. However, the Company makes no showing that it is
13 experiencing financial impairment of any kind, difficulty in attracting capital through
14 issuance of equity or debt, financial problems due to regulatory lag, or an adverse
15 regulatory climate. The proposed increases are not justified based on the key financial and
16 regulatory factors impacting the Company.

17 **Q. Company witness Bulkley's testimony, which Company witness Pritz supports,**
18 **argues that the 10.25% proposed ROE is justified because it is the average of the**
19 **thirteen mid-point values she calculated using various adaptations of discounted cash**
20 **flow, capital asset pricing model, and risk premium analyses.⁸ Do you have any issues**
21 **with Ms. Bulkley's analysis?**

⁸ Company witness Bulkley direct testimony at p. 90, Fig. 21.

1 A. Yes. I take no issue with the fact that the average of the mid-range values Ms. Bulkley
2 presents is 10.25%. That can be verified with simple math. However, the argument that
3 this arithmetic exercise is sufficient to establish a reasonable return on equity is not
4 reasonable. Regardless of the outcome of any mathematical exercise, and as recognized by
5 Ms. Bulkley, a reasonable return on equity must be assessed in light of risks faced by the
6 Company and the balancing of the interests of the utility and its customers.⁹ With that in
7 mind, I do have concerns with methods used by Ms. Bulkley that are based on quantifying
8 a premium above the risk-free cost of capital based on broad market conditions. It is not
9 surprising that the Company relies on the Capital Asset Pricing Model (CAPM), Empirical
10 Capital Asset Pricing Model (ECAPM), and Bond Yield Plus Risk Premium (Risk
11 Premium) methods. They all yield ROEs that are unreasonably high based on the broad
12 assertion that utility ROEs should be higher than they are. The problem is that the ROEs
13 that result from these methods are in no way comparable to market trends in general. When
14 these ROE-inflating values are eliminated from consideration, the DCF models yield a
15 range of 8.31% to 10.32%, with a mean value of 9.33%. And, as reported by the Edison
16 Electric Institute, the average awarded ROE in 2021, the last full year of data reported, was
17 9.40%,¹⁰ a full 85 basis points lower than the ROE proposed by the Company. Both the
18 DCF values and the EEI value are very close to the current authorized ROE for the
19 Company of 9.35% (before adjustment for risk reduction).

20 **Q. What do you conclude from this information?**

⁹ *Id.* at p. 9:1-20.

¹⁰ Edison Electric Institute, *2021 Financial Review (2021 EEI Financial Review)*, at p. 71; available at: https://www.eei.org/-/media/Project/EEI/Documents/Issues-and-Policy/Finance-And-Tax/Financial_Review/FinancialReview_2021.pdf?la=en&hash=C3E87E93984D98119CA9494E3353788375C4E8C3.

1 A. In my opinion, an authorized ROE of no more than the current authorized level of 9.15%
2 (after adjustment for risk reduction) remains reasonable for the Company.

3 **Q. Does the Company face business risks that are greater than those faced by other**
4 **utilities?**

5 A. Yes, and no. The Company faces some business risk associated with the fact that it is still
6 heavily dependent on coal for electricity generation. In not moving more quickly to get
7 itself out of coal fuel dependence, and fossil fuel dependence in general, the Company does
8 face environmental and other risks associated with its generation assets.¹¹ But this is not a
9 risk that customers should pay for through increased ROE, and certainly not through
10 increased reliance on more expensive equity financing. On the other hand, the Company
11 has a potential opportunity to securitize its stranded cost obligations relating to coal
12 generation,¹² which would de-risk its excess dependence on coal generation and possibly
13 reduce the burden to customers that otherwise might be allocated to them.

14 **Q. How should the Commission's ROE determination in the most recent Arizona Public**
15 **Service (APS) case influence the Commission's decision about a just and reasonable**
16 **ROE for the Company in this proceeding?**

17 A. It should not. There is no regulatory and rate making logic to arguing, as Company witness
18 Bulkley does,¹³ that the Commission's ROE decision in the APS rate case and the response
19 of the financial institutions and rating agencies should impact the authorized ROE for the
20 Company. The Company's position constitutes an inappropriate collateral attack on the

¹¹ The Company lags the general industry trend of reducing dependence on coal and maintains a high dependence on this costly fuel source. *See* Bulkley direct at pp. 81-82. *Also see generally* EEI 2021 Financial Review, at pp. 47-51.

¹² Company witness Pritz direct testimony at pp. 12:1-14:25.

¹³ Bulkley direct at pp. 72:18-80:8, citing Arizona Corporation Commission Docket No. E-01345A-19-0236, Commissioner Olson Proposed Amendment No. 1 to the Recommended Opinion and Order, October 4, 2021.

Commission's decision in the APS case based on facts that are not present in this proceeding. Moreover, the relief requested—a higher ROE for the Company than it would otherwise merit—is outrageously unreasonable. It is not the job of the Commission to attempt to curry favor with New York financial institutions by inflating the earnings for Company shareholders based on their disagreements with the Commission in the APS case.

Q. Is it reasonable for the Company to view its transition away from fossil fuels¹⁴ as a reason to assign increased financial risk to the Company and therefore increase the allowed ROE?

A. Absolutely not. Company witness Bulkley is simply wrong in concluding that a transition to a clean energy portfolio increases the Company's overall risk profile.¹⁵ The Company's pending transition away from fossil fuels is a risk and cost reducer.¹⁶ The market for renewable energy development is mature and efficient. The Inflation Reduction Act (IRA) makes it even more financially and economically attractive to make the transition. The risk reduction benefits of decreased regulatory oversight, waste management, environmental compliance risk, environmental litigation, customer acceptance, resilience, and other attributes of a clean energy portfolio, as well as the declining costs, multi-use attributes, high availability, reduced or eliminated fuel price volatility risk, and other benefits of clean energy technologies all portend earnings assurance and stability and lower costs for electric service. Customers should not have to pay the Company unearned profits before the transition is completed.

¹⁴ Bulkley direct at p. 83:3 through 84:5.

¹⁵ Bulkley direct at p. 84:7 through 84:13.

¹⁶ See M. Dyson, A. Engel, and J. Farbes, *The Economics of Clean Energy Portfolios*, RMI (2018), available at: <https://rmi.org/insight/the-economics-of-clean-energy-portfolios/>.

1 **Q. Is there any analytical support for the idea that the ROE for utilities engaged in a**
2 **clean energy transition should be lower than otherwise because of the reduced risk**
3 **associated with a transition to clean energy resources?**

4 A. Yes. Company witness Bulkley filed supplemental testimony in this proceeding that over
5 the past three years the average allowed ROE for proxy group companies, with which the
6 Company's clean energy goals are generally consistent, was 62 basis points lower than the
7 Company's request.¹⁷

8 **Q. Do the Company's proposals for ROE and capital structure account for the**
9 **opportunities presented by the IRA?**

10 A. No. This is serious and fundamental flaw in the Company's assessment of its financial
11 outlook. Late as it is to the transition away from fossil fuels and toward clean and renewable
12 resources, the Company is perfectly situated to take advantage of the clean energy
13 investment incentives in the recently enacted IRA. The Company did not assess the impacts
14 of the IRA on its financial proposals in its initial application or in supplemental testimony
15 filed pursuant to the request from Commissioner Márquez Peterson's June 2, 2022 request.
16 The IRA could significantly reduce the financial challenges facing the Company in
17 transitioning away from excessive reliance on fossil fuels. This reduces the risks to the
18 Company and countenances an ROE that is at the lower end of estimated ROEs.

19 **Q. Does the Company face excessive regulatory risks compared to other utilities?**

¹⁷ Company witness Bulkley supplemental testimony at p. 3:3-4.

1 A. No. The Company enjoys the benefits of several cost recovery mechanisms that both
2 reduce the problems of regulatory lag and ensure a reasonable opportunity to earn a
3 reasonable return.¹⁸

4 **Q. What do you conclude from your review of these issues regarding a reasonable ROE**
5 **for the Company?**

6 A. I conclude that the Company has low and declining risk compared to other investor-owned
7 businesses and utilities, and that as a result, an allowed ROE of no more than 9.15%
8 remains reasonable.

9 **Q. Is it reasonable for the Company to propose to increase the equity fraction in its**
10 **capital structure from 52.95% to 54.32%, or 137 basis points?**

11 A. No. As Company witness Pritz points out, the Company has taken advantage of favorable
12 debt markets to reduce its cost of debt to 3.82%, or 83 basis points from the previous 4.65%
13 cost.¹⁹ This decrease benefits customers and should reduce the overall cost of capital for
14 customers as reflected in the revenue requirement. It is unreasonable for the Company to
15 increase the equity fraction in its capital structure because this proposed change obviates
16 the benefits of lower costs, effectively assigning the benefits to shareholders at the expense
17 of customers and increases reliance on more expensive equity. The Company proposal to
18 increase the equity fraction in its capital structure is unreasonable.

19 **Q. What do you recommend that the Commission do in response to the Company's**
20 **request to increase the equity fraction in its capital structure?**

¹⁸ See Bulkley direct at pp. 65:14-67:21.

¹⁹ Pritz direct at pp. 9:12-10:15.

1 A. I recommend that the Commission reject the Company's proposal to increase the equity
2 fraction in its capital structure to 54.32%, and instead, to allow no higher equity fraction
3 than the allowed level of 52.95%.

4 V. **SUMMARY OF RECOMMENDATIONS**

5 **Q. Please summarize your recommendations to the Commission on the issues you**
6 **addressed.**

7 A. First, I recommend that the Commission reject the Company's proposal to establish the
8 allowed ROE at 10.25%, and to instead award an ROE no higher than the Company's
9 current authorized ROE of 9.15%. Second, I recommend that the Commission reject the
10 Company's proposal to increase the equity to debt ratio to 54.32% equity to 45.38% debt,
11 and instead to authorize an equity fraction of no more than 52.95% equity (and 46.92%
12 debt).

13 **Q. Does this conclude your testimony?**

14 A. Yes.

EXHIBIT KRR-1: Rábago Resume

Karl R. Rábago**Rábago Energy LLC**2025 East 24th Avenue, Denver, CO 80205c/SMS: +1.512.968.7543 | e: rabago@me.com | rabagoenergy.com

Nationally recognized leader and innovator in electricity and energy law, policy, and regulation. Experienced as a regulatory expert, utility executive, research and development manager, sustainability leader, senior government official, educator, and advocate. Law teaching experience at Pace University Elisabeth Haub School of Law, University of Houston Law Center, and U.S. Military Academy at West Point. Military veteran.

Employment**RÁBAGO ENERGY LLC**

Principal: July 2012—Present. Consulting practice dedicated to providing business sustainability, expert witness, and regulatory advice and services to organizations in the clean and advanced energy sectors. Prepared and submitted testimony in more than 35 jurisdictions and 140 electricity and gas regulatory proceedings. Recognized national leader in development and implementation of innovative “Value of Solar” alternative to traditional net metering. Additional information at rabagoenergy.com.

- Director, Colorado Electric Transmission Authority (2022-present).
- Chairman of the Board, Center for Resource Solutions (1997-present). CRS is a not-for-profit organization based at the Presidio in California. CRS developed and manages the Green-e Renewable Electricity Brand, a nationally and internationally recognized branding program for green power and green pricing products and programs. Past chair of the Green-e Governance Board.
- Director, Solar United Neighbors (2018-present).
- Advisor, Commission Shift (2021-present).
- Director, Texas Solar Energy Society (2022-present).

PACE ENERGY AND CLIMATE CENTER, PACE UNIVERSITY ELISABETH HAUB SCHOOL OF LAW

Senior Policy Advisor: September 2019—September 2020. Part-time advisor and staff member. Provided expert witness, project management, and business development support on electric and gas regulatory and policy issues and activities.

Executive Director: May 2014—August 2019. Leader of a team of professional and technical experts and law students in energy and climate law, policy, and regulation. Secured funding for and managed execution of regulatory intervention, research, market development support, and advisory services. Taught Energy Law. Provided learning and development opportunities for law students. Additional activities:

- Director, Alliance for Clean Energy – New York (2018-2019).
- Director, Interstate Renewable Energy Council (IREC) (2012-2018).
- Co-Director and Principal Investigator, Northeast Solar Energy Market Coalition (2015-2017). The NESEMC was a US Department of Energy’s SunShot Initiative Solar Market Pathways project. Funded under a cooperative agreement between the US DOE and Pace University, the NESEMC worked to harmonize solar market policy and advance supportive policy and regulatory practices in the northeast United States.

Karl R. Rábago

AUSTIN ENERGY – THE CITY OF AUSTIN, TEXAS

Vice President, Distributed Energy Services: April 2009—June 2012. Executive in one of the largest public power electric utilities, serving more than one million people in central Texas. Responsible for management and oversight of energy efficiency, demand response, and conservation programs; low-income weatherization; distributed solar and other renewable energy technologies; green buildings program; key accounts relationships; electric vehicle infrastructure; and market research and product development. Executive sponsor of Austin Energy's participation in an innovative federally funded smart grid demonstration project led by the Pecan Street Project. Led teams that successfully secured over \$39 million in federal stimulus funds for energy efficiency, smart grid, and advanced electric transportation initiatives. Additional activities included:

- Director, Renewable Energy Markets Association. REMA is a trade association dedicated to maintaining and strengthening renewable energy markets in the United States.
- Member, Pedernales Electric Cooperative Member Advisory Board. Invited by the Board of Directors to sit on first-ever board to provide formal input and guidance on energy efficiency and renewable energy issues for the nation's largest electric cooperative.

THE AES CORPORATION

Director, Government & Regulatory Affairs: June 2006—December 2008. Director, Global Regulatory Affairs, provided regulatory support and group management to AES's international electric utility operations on five continents. Managing Director, Standards and Practices, for Greenhouse Gas Services, LLC, a GE Energy and AES venture committed to generating and marketing voluntary market greenhouse gas credits. Government and regulatory affairs manager for AES Wind Generation. Managed a portfolio of regulatory and legislative initiatives to support wind energy market development in Texas, across the United States, and in many international markets.

JICARILLA APACHE NATION UTILITY AUTHORITY

Director: 1998—2008. Located in New Mexico, the JANUA was an independent utility developing profitable and autonomous utility services that provided natural gas, water utility services, low-income housing, and energy planning for the Nation. Authored "First Steps" renewable energy and energy efficiency strategic plan with support from U.S. Department of Energy.

HOUSTON ADVANCED RESEARCH CENTER

Group Director, Energy and Buildings Solutions: December 2003—May 2006. Leader of energy and building science staff at a mission-driven not-for-profit contract research organization based in The Woodlands, Texas. Responsible for developing, maintaining, and expanding on technology development, application, and commercialization support programmatic activities, including the Center for Fuel Cell Research and Applications; the Gulf Coast Combined Heat and Power Application Center; and the High-Performance Green Buildings Practice. Secured funding for major new initiative in carbon nanotechnology applications in the energy sector.

- President, Texas Renewable Energy Industries Association. As elected president of the statewide business association, led and managed successful efforts to secure and implement significant expansion of the state's renewable portfolio standard as well as other policy, regulatory, and market development activities.
- Director, Southwest Biofuels Initiative. Established the Initiative as an umbrella structure for multiple biofuels related projects.

Karl R. Rábago

- Member, Committee to Study the Environmental Impacts of Windpower, National Academies of Science National Research Council. The Committee was chartered by Congress and the Council on Environmental Quality to assess the impacts of wind power on the environment.
- Advisory Board Member, Environmental & Energy Law & Policy Journal, University of Houston Law Center.

CARGILL DOW LLC (NOW NATUREWORKS, LLC)

Sustainability Alliances Leader: April 2002—December 2003. Integrated sustainability principles into all aspects of a ground-breaking bio-based polymer manufacturing venture. Responsible for maintaining, enhancing, and building relationships with stakeholders in the worldwide sustainability community, as well as managing corporate and external sustainability initiatives.

- Successfully completed Minnesota Management Institute at University of Minnesota Carlson School of Management, an alternative to an executive MBA program that surveyed fundamentals and new developments in finance, accounting, operations management, strategic planning, and human resource management.

ROCKY MOUNTAIN INSTITUTE

Managing Director/Principal: October 1999—April 2002. Co-authored “Small Is Profitable,” a comprehensive analysis of the benefits of distributed energy resources. Provided consulting and advisory services to help business and government clients achieve sustainability through application and incorporation of Natural Capitalism principles.

- President of the Board, Texas Ratepayers Organization to Save Energy. Texas R.O.S.E. is a non-profit organization advocating low-income consumer issues and energy efficiency programs.
- Co-Founder and Chair of the Advisory Board, Renewable Energy Policy Project-Center for Renewable Energy and Sustainable Technology. REPP-CREST was a national non-profit research and internet services organization.

CH2M HILL

Vice President, Energy, Environment and Systems Group: July 1998—August 1999. Responsible for providing consulting services to a wide range of energy-related businesses and organizations, and for creating new business opportunities in the energy industry for an established engineering and consulting firm. Completed comprehensive electric utility restructuring studies for Colorado and Alaska.

PLANERGY

Vice President, New Energy Markets: January 1998—July 1998. Responsible for developing and managing new business opportunities for the energy services market. Provided consulting and advisory services to utility and energy service companies.

ENVIRONMENTAL DEFENSE FUND

Energy Program Manager: March 1996—January 1998. Managed renewable energy, energy efficiency, and electric utility restructuring programs. Led regulatory intervention activities in Texas and California. In Texas, played a key role in crafting Deliberative Polling processes. Participated in national environmental and energy advocacy networks, including the Energy Advocates Network, the National Wind Coordinating Committee, the NCSL Advisory Committee on Energy, and the PV-COMPACT Coordinating Council. Frequently appeared before the Texas Legislature, Austin City Council, and regulatory commissions on electric restructuring issues.

Karl R. Rábago

UNITED STATES DEPARTMENT OF ENERGY

Deputy Assistant Secretary, Utility Technologies: January 1995–March 1996. Manager of the Department's programs in renewable energy technologies and systems, electric energy systems, energy efficiency, and integrated resource planning. Supervised technology research, development and deployment activities in photovoltaics, wind energy, geothermal energy, solar thermal energy, biomass energy, high-temperature superconductivity, transmission and distribution, hydrogen, and electric and magnetic fields. Managed, coordinated, and developed international agreements. Supervised development and deployment support activities at national laboratories. Developed, advocated, and managed a Congressional budget appropriation of approximately \$300 million.

STATE OF TEXAS

Commissioner, Public Utility Commission of Texas. May 1992–December 1994. Appointed by Governor Ann W. Richards. Regulated electric and telephone utilities in Texas. Co-chair and organizer of the Texas Sustainable Energy Development Council. Vice-Chair of the National Association of Regulatory Utility Commissioners (NARUC) Committee on Energy Conservation. Member and co-creator of the Photovoltaic Collaborative Market Project to Accelerate Commercial Technology (PV-COMPACT).

LAW TEACHING

Professor for a Designated Service: Pace University Elisabeth Haub School of Law, 2014-2019. Non-tenured member of faculty. Taught Energy Law. Supervised a student intern practice.

Associate Professor of Law: University of Houston Law Center, 1990–1992. Full time, tenure track member of faculty. Courses taught: Criminal Law, Environmental Law, Criminal Procedure, Environmental Crimes Seminar, Wildlife Protection Law.

Assistant Professor: United States Military Academy, West Point, New York, 1988–1990. Member of the faculty in the Department of Law. Honorably discharged in August 1990, as Major in the Regular Army. Courses taught: Constitutional Law, Military Law, and Environmental Law Seminar.

LITIGATION

Trial Defense Attorney and Prosecutor, U.S. Army Judge Advocate General's Corps, Fort Polk, Louisiana, January 1985–July 1987. Assigned to Trial Defense Service and Office of the Staff Judge Advocate.

NON-LEGAL MILITARY SERVICE

Armored Cavalry Officer, 2d Squadron 9th Armored Cavalry, Fort Stewart, Georgia, May 1978–August 1981. Served as Logistics Staff Officer (S-4). Managed budget, supplies, fuel, ammunition, and other support for an Armored Cavalry Squadron. Served as Support Platoon Leader for the Squadron (logistical support), and as line Platoon Leader in an Armored Cavalry Troop. Graduate of Airborne and Ranger Schools. Special training in Air Mobilization Planning and Nuclear, Biological and Chemical Warfare.

Karl R. Rábago

Formal Education

LL.M., Environmental Law, Pace University School of Law, 1990: Curriculum designed to provide breadth and depth in study of theoretical and practical aspects of environmental law. Courses included: International and Comparative Environmental Law, Conservation Law, Land Use Law, Seminar in Electric Utility Regulation, Scientific and Technical Issues Affecting Environmental Law, Environmental Regulation of Real Estate, Hazardous Wastes Law. Individual research with Hudson Riverkeeper Fund, Garrison, New York, on federal regulation of cooling water intake structures for electric power plants.

LL.M., Military Law, U.S. Army Judge Advocate General's School, 1988: Curriculum designed to prepare Judge Advocates for senior level staff service. Courses included: Administrative Law, Defensive Federal Litigation, Government Information Practices, Advanced Federal Litigation, Federal Tort Claims Act Seminar, Legal Writing and Communications, Comparative International Law.

J.D. with Honors, University of Texas School of Law, 1984: Attended law school under the U.S. Army Funded Legal Education Program, a fully funded scholarship awarded to 25 or fewer officers each year. Served as Editor-in-Chief (1983–84); Articles Editor (1982–83); Member (1982) of the Review of Litigation. Moot Court, Mock Trial, Board of Advocates. Summer internship at Staff Judge Advocate's offices. Prosecuted first cases prior to entering law school.

B.B.A., Business Management, Texas A&M University, 1977: ROTC Scholarship (3–yr). Member: Corps of Cadets, Parson's Mounted Cavalry, Wings & Sabers Scholarship Society, Rudder's Rangers, Town Hall Society, Freshman Honor Society, Alpha Phi Omega service fraternity.

Karl R. Rábago

Selected Publications

Climate Change Law: An Introduction, contributing author (Introduction to Energy Law), Elgar (2021).

Distributed Generation Law, contributing author, American Bar Association Environment, Energy, and Resources Section (August 2020)

National Standard Practice Manual for Benefit-Cost Analysis of Distributed Energy Resources, contributing author, National Energy Screening Project (August 2020)

Achieving 100% Renewables: Supply-Shaping through Curtailment, with Richard Perez, Marc Perez, and Morgan Putnam, PV Tech Power, Vol. 19 (May 2019).

A Radical Idea to Get a High-Renewable Electric Grid: Build Way More Solar and Wind than Needed, with Richard Perez, The Conversation, online at <http://bit.ly/2YjnM15> (May 29, 2019).

Reversing Energy System Inequity: Urgency and Opportunity During the Clean Energy Transition, with John Howat, John Colgan, Wendy Gerlitz, and Melanie Santiago-Mosier, National Consumer Law Center, online at www.nclc.org (Feb. 26, 2019).

Revisiting Bonbright's Principles of Public Utility Rates in a DER World, with Radina Valova, The Electricity Journal, Vol. 31, Issue 8, pp. 9-13 (Oct. 2018).

Achieving very high PV penetration – The need for an effective electricity remuneration framework and a central role for grid operators, with Richard Perez (corresponding author), Energy Policy, Vol. 96, pp. 27-35 (2016).

The Net Metering Riddle, Electricity Policy.com, April 2016.

The Clean Power Plan, Power Engineering Magazine (invited editorial), Vol. 119, Issue 12 (Dec. 2, 2015)

The 'Sharing Utility:' Enabling & Rewarding Utility Performance, Service & Value in a Distributed Energy Age, co-author, 51st State Initiative, Solar Electric Power Association (Feb. 27, 2015)

Rethinking the Grid: Encouraging Distributed Generation, Building Energy Magazine, Vol. 33, No. 1 Northeast Sustainable Energy Association (Spring 2015)

The Value of Solar Tariff: Net Metering 2.0, The ICER Chronicle, Ed. 1, p. 46 [International Confederation of Energy Regulators] (December 2013)

A Regulator's Guidebook: Calculating the Benefits and Costs of Distributed Solar Generation, co-author with Jason Keyes, Interstate Renewable Energy Council (October 2013)

The 'Value of Solar' Rate: Designing an Improved Residential Solar Tariff, Solar Industry, Vol. 6, No. 1 (Feb. 2013)

Jicarilla Apache Nation Utility Authority Strategic Plan for Energy Efficiency and Renewable Energy Development, lead author & project manager, U.S. Department of Energy First Steps Toward Developing Renewable Energy and Energy Efficiency on Tribal Lands Program (2008)

A Review of Barriers to Biofuels Market Development in the United States, 2 Environmental & Energy Law & Policy Journal 179 (2008)

A Strategy for Developing Stationary Biodiesel Generation, Cumberland Law Review, Vol. 36, p.461 (2006)

Evaluating Fuel Cell Performance through Industry Collaboration, co-author, Fuel Cell Magazine (2005)

Applications of Life Cycle Assessment to NatureWorks™ Polylactide (PLA) Production, co-author, Polymer Degradation and Stability 80, 403-19 (2003)

Karl R. Rábago

An Energy Resource Investment Strategy for the City of San Francisco: Scenario Analysis of Alternative Electric Resource Options, contributing author, Prepared for the San Francisco Public Utilities Commission, Rocky Mountain Institute (2002)

Small Is Profitable: The Hidden Economic Benefits of Making Electrical Resources the Right Size, co-author, Rocky Mountain Institute (2002)

Socio-Economic and Legal Issues Related to an Evaluation of the Regulatory Structure of the Retail Electric Industry in the State of Colorado, with Thomas E. Feiler, Colorado Public Utilities Commission and Colorado Electricity Advisory Panel (April 1, 1999)

Study of Electric Utility Restructuring in Alaska, with Thomas E. Feiler, Legislative Joint Committee on electric Restructuring and the Alaska Public Utilities Commission (April 1, 1999)

New Markets and New Opportunities: Competition in the Electric Industry Opens the Way for Renewables and Empowers Customers, EEBA Excellence (Journal of the Energy Efficient Building Association) (Summer 1998)

Building a Better Future: Why Public Support for Renewable Energy Makes Sense, Spectrum: The Journal of State Government (Spring 1998)

The Green-e Program: An Opportunity for Customers, with Ryan Wiser and Jan Hamrin, Electricity Journal, Vol. 11, No. 1 (January/February 1998)

Being Virtual: Beyond Restructuring and How We Get There, Proceedings of the First Symposium on the Virtual Utility, Kluwer Press (1997)

Information Technology, Public Utilities Fortnightly (March 15, 1996)

Better Decisions with Better Information: The Promise of GIS, with James P. Spiers, Public Utilities Fortnightly (November 1, 1993)

The Regulatory Environment for Utility Energy Efficiency Programs, Proceedings of the Meeting on the Efficient Use of Electric Energy, Inter-American Development Bank (May 1993)

An Alternative Framework for Low-Income Electric Ratepayer Services, with Danielle Jaussaud and Stephen Benenson, Proceedings of the Fourth National Conference on Integrated Resource Planning, National Association of Regulatory Utility Commissioners (September 1992)

What Comes Out Must Go In: The Federal Non-Regulation of Cooling Water Intakes Under Section 316 of the Clean Water Act, Harvard Environmental Law Review, Vol. 16, p. 429 (1992)

Least Cost Electricity for Texas, State Bar of Texas Environmental Law Journal, Vol. 22, p. 93 (1992)

Environmental Costs of Electricity, Pace University School of Law, Contributor–Impingement and Entrainment Impacts, Oceana Publications, Inc. (1990)

EXHIBIT KRR-2: Rábago Prior Testimony

Testimony Submitted by Karl R. Rábago**(as of 19 December 2022)**

Date	Proceeding	Case/Docket #	On Behalf Of:
Dec. 21, 2012	VA Electric & Power Special Solar Power Tariff	Virginia State Corporation Commission Case # PUE-2012-00064	Southern Environmental Law Center
May 10, 2013	Georgia Power Company 2013 IRP	Georgia Public Service Commission Docket # 36498	Georgia Solar Energy Industries Association
Jun. 23, 2013	Louisiana Public Service Commission Re-examination of Net Metering Rules	Louisiana Public Service Commission Docket # R-31417	Gulf States Solar Energy Industries Association
Aug. 29, 2013	DTE (Detroit Edison) 2013 Renewable Energy Plan Review (Michigan)	Michigan Public Utilities Commission Case # U-17302	Environmental Law and Policy Center
Sep. 5, 2013	CE (Consumers Energy) 2013 Renewable Energy Plan Review (Michigan)	Michigan Public Utilities Commission Case # U-17301	Environmental Law and Policy Center
Sep. 27, 2013	North Carolina Utilities Commission 2012 Avoided Cost Case	North Carolina Utilities Commission Docket # E-100, Sub. 136	North Carolina Sustainable Energy Association
Oct. 18, 2013	Georgia Power Company 2013 Rate Case	Georgia Public Service Commission Docket # 36989	Georgia Solar Energy Industries Association
Nov. 4, 2013	PEPCO Rate Case (District of Columbia)	District of Columbia Public Service Commission Formal Case # 1103	Grid 2.0 Working Group & Sierra Club of Washington, D.C.
Apr. 24, 2014	Dominion Virginia Electric Power 2013 IRP	Virginia State Corporation Commission Case # PUE-2013-00088	Environmental Respondents
Apr. 25, 2014	North Carolina Utilities Commission 2014 Avoided Cost Case - Direct	North Carolina Utilities Commission Docket # E-100, Sub. 140	Southern Alliance for Clean Energy
May 7, 2014	Arizona Corporation Commission Investigation on the Value and Cost of Distributed Generation	Arizona Corporation Commission Docket # E-00000J-14-0023	Rábago Energy LLC (invited presentation and workshop participation)
Jun. 2, 2014	North Carolina Utilities Commission 2014 Avoided Cost Case – Response (Corrected)	North Carolina Utilities Commission Docket # E-100, Sub. 140	Southern Alliance for Clean Energy
Jun. 20, 2014	North Carolina Utilities Commission 2014 Avoided Cost Case – Rebuttal	North Carolina Utilities Commission Docket # E-100, Sub. 140	Southern Alliance for Clean Energy

Testimony Submitted by Karl R. Rábago**(as of 19 December 2022)**

Jul. 23, 2014	Florida Energy Efficiency and Conservation Act, Goal Setting – FPL, Duke, TECO, Gulf	Florida Public Service Commission Docket # 130199-EI, 130200-EI, 130201-EI, 130202-EI	Southern Alliance for Clean Energy
Sep. 19, 2014	Ameren Missouri's Application for Authorization to Suspend Payment of Solar Rebates	Missouri Public Service Commission File No. ET-2014-0350, Tariff # YE-2014-0494	Missouri Solar Energy Industries Association
Aug. 6, 2014	Appalachian Power Company 2014 Biennial Rate Review	Virginia State Corporation Commission Case # PUE-2014-00026	Southern Environmental Law Center (Environmental Respondents)
Aug. 13, 2014	Wisconsin Public Service Corp. 2014 Rate Application	Wisconsin Public Service Commission Docket # 6690-UR-123	RENEW Wisconsin and Environmental Law & Policy Center
Aug. 28, 2014	WE Energies 2014 Rate Application	Wisconsin Public Service Commission Docket # 05-UR-107	RENEW Wisconsin and Environmental Law & Policy Center
Sep. 18, 2014	Madison Gas & Electric Company 2014 Rate Application	Wisconsin Public Service Commission Docket # 3720-UR-120	RENEW Wisconsin and Environmental Law & Policy Center
Sep. 29, 2014	SOLAR, LLC v. Missouri Public Service Commission	Missouri District Court Case # 14AC-CC00316	SOLAR, LLC
Jan. 28, 2016 (date of CPUC order)	Order Instituting Rulemaking to Develop a Successor to Existing Net Energy Metering Tariffs, etc.	California Public Utilities Commission Rulemaking 14-07-002	The Utility Reform Network (TURN)
Mar. 20, 2015	Orange and Rockland Utilities 2015 Rate Application	New York Public Service Commission Case # 14-E-0493	Pace Energy and Climate Center
May 22, 2015	DTE Electric Company Rate Application	Michigan Public Service Commission Case # U-17767	Michigan Environmental Council, NRDC, Sierra Club, and ELPC
Jul. 20, 2015	Hawaiian Electric Company and NextEra Application for Change of Control	Hawai'i Public Utilities Commission Docket # 2015-0022	Hawai'i Department of Business, Economic Development, and Tourism
Sep. 2, 2015	Wisconsin Public Service Company Rate Application	Wisconsin Public Service Commission Case # 6690-UR-124	ELPC
Sep. 15, 2015	Dominion Virginia Electric Power 2015 IRP	Virginia State Corporation Commission Case # PUE-2015-00035	Environmental Respondents
Sep. 16, 2015	NYSEG & RGE Rate Cases	New York Public Service Commission Cases 15-E-0283, -0285	Pace Energy and Climate Center

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Oct. 14, 2015	Florida Power & Light Application for CCPN for Lake Okeechobee Plant	Florida Public Service Commission Case 150196-El	Environmental Confederation of Southwest Florida
Oct. 27, 2015	Appalachian Power Company 2015 IRP	Virginia State Corporation Commission Case # PUE- 2015-00036	Environmental Respondents
Nov. 23, 2015	Narragansett Electric Power/National Grid Rate Design Application	Rhode Island Public Utilities Commission Docket No. 4568	Wind Energy Development, LLC
Dec. 8, 2015	State of West Virginia, et al., v. U.S. EPA, et al.	U.S. Court of Appeals for the District of Columbia Circuit Case No. 15-1363 and Consolidated Cases	Declaration in Support of Environmental and Public Health Intervenor in Support of Movant Respondent- Intervenor's Responses in Opposition to Motions for Stay
Dec. 28, 2015	Ohio Power/AEP Affiliate PPA Application	Public Utilities Commission of Ohio Case No. 14-1693-EL- RDR	Environmental Law and Policy Center
Jan. 19, 2016	Ohio Edison Company, Cleveland Electric Illuminating Company, and Toledo Edison Company Application for Electric Security Plan (FirstEnergy Affiliate PPA)	Public Utilities Commission of Ohio Case No. 14-1297-EL- SSO	Environmental Law and Policy Center
Jan. 22, 2016	Northern Indiana Public Service Company (NIPSCO) Rate Case	Indiana Utility Regulatory Commission Cause No. 44688	Citizens Action Coalition and Environmental Law and Policy Center
Mar. 18, 2016	Northern Indiana Public Service Company (NIPSCO) Rate Case – Settlement Testimony	Indiana Utility Regulatory Commission Cause No. 44688	Joint Intervenor – Citizens Action Coalition and Environmental Law and Policy Center
Mar. 18, 2016	Comments on Pilot Rate Proposals by MidAmerican and Alliant	Iowa Utility Board NOI-2014- 0001	Environmental Law and Policy Center
May 27, 2016	Consolidated Edison of New York Rate Case	New York Public Service Commission Case No. 16-E- 0060	Pace Energy and Climate Center
Jun. 21, 2016	Federal Trade Commission: Workshop on Competition and Consumer Protection Issues in Solar Energy - Invited workshop presentation	Federal Trade Commission - Solar Electricity Project No. P161200	Pace Energy and Climate Center
Aug. 17, 2016	Dominion Virginia Electric Power 2016 IRP	Virginia State Corporation Commission Case # PUE- 2016-00049	Environmental Respondents

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Sep. 13, 2016	Appalachian Power Company 2016 IRP	Virginia State Corporation Commission Case # PUE-2016-00050	Environmental Respondents
Oct. 27, 2016	Consumers Energy PURPA Compliance Filing	Michigan Public Service Commission Case No. U-18090	Environmental Law & Policy Center, "Joint Intervenors"
Oct. 28, 2016	Delmarva, PEPCO (PHI) Utility Transformation Filing – Review of Filing & Utilities of the Future Whitepaper	Maryland Public Service Commission Case PC 44	Public Interest Advocates
Dec. 1, 2016	DTE Electric Company PURPA Compliance Filing	Michigan Public Service Commission Case No. U-18091	Environmental Law & Policy Center, "Joint Intervenors"
Dec. 16, 2016	Development of New Alternative Net Metering Tariffs - Rebuttal of Unitil Testimony	New Hampshire Public Utilities Commission Docket No. DE 16-576	New Hampshire Sustainable Energy Association ("NHSEA")
Jan. 13, 2017	Gulf Power Company Rate Case	Florida Public Service Commission Docket No. 160186-EI	Earthjustice, Southern Alliance for Clean Energy, League of Women Voters-Florida
Jan. 13, 2017	Alpena Power Company PURPA Compliance Filing	Michigan Public Service Commission Case No. U-18089	Environmental Law & Policy Center, "Joint Intervenors"
Jan. 13, 2017	Indiana Michigan Power Company PURPA Compliance Filing	Michigan Public Service Commission Case No. U-18092	Environmental Law & Policy Center, "Joint Intervenors"
Jan. 13, 2017	Northern States Power Company PURPA Compliance Filing	Michigan Public Service Commission Case No. U-18093	Environmental Law & Policy Center, "Joint Intervenors"
Jan. 13, 2017	Upper Peninsula Power Company PURPA Compliance Filing	Michigan Public Service Commission Case No. U-18094	Environmental Law & Policy Center, "Joint Intervenors"
Mar. 10, 2017	Eversource Energy Grid Modernization Plan	Massachusetts Department of Public Utilities Case No. 15-122/15-123	Cape Light Compact
Apr. 27, 2017	Eversource Rate Case & Grid Modernization Investments	Massachusetts Department of Public Utilities Case No. 17-05	Cape Light Compact
May 2, 2017	AEP Ohio Power Electric Security Plan	Public Utilities Commission of Ohio Case No. 16-1852-EL-SSO	Environmental Law & Policy Center
Jun. 2, 2017	Vectren Energy TDSIC Plan	Indiana Utility Regulatory Commission Cause No. 44910	Citizens Action Coalition & Valley Watch

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Jul. 26, 2017	Vectren Energy 2018-2020 Energy Efficiency Plan	Indiana Utility Regulatory Commission Cause No. 44927	Citizens Action Coalition
Jul. 28, 2017	Vectren Energy 2016-2017 Energy Efficiency Plan	Indiana Utility Regulatory Commission Cause No. 44645	Citizens Action Coalition
Aug. 1, 2017	Interstate Power & Light (Alliant) 2017 Rate Application	Iowa Utilities Board Docket No. RPU-2017-0001	Environmental Law & Policy Center, Iowa Environmental Council, Natural Resources Defense Council, and Solar Energy Industries Assoc.
Aug. 11, 2017	Dominion Virginia Electric Power 2017 IRP	Virginia State Corporation Commission Case # PUR-2017-00051	Environmental Respondents
Aug. 18, 2017	Appalachian Power Company 2017 IRP	Virginia State Corporation Commission Case # PUR-2017-00045	Environmental Respondents
Aug. 23, 2017	Pennsylvania Solar Future Project	Pennsylvania Dept. of Environmental Protection - Alternative Ratemaking Webinar	Pace Energy and Climate Center
Aug. 25, 2017	Niagara Mohawk Power Co. d/b/a National Grid Rate Case	New York Public Service Commission Case # 17-E-0238, 17-G-0239	Pace Energy and Climate Center
Sep. 15, 2017	Niagara Mohawk Power Co. d/b/a National Grid Rate Case	New York Public Service Commission Case # 17-E-0238, 17-G-0239	Pace Energy and Climate Center
Oct. 20, 2017	Missouri PSC Working Case to Explore Emerging Issues in Utility Regulation	Missouri Public Service Commission File No. EW-2017-0245	Renew Missouri
Nov. 21, 2017	Central Hudson Gas & Electric Co. Electric and Gas Rates Cases	New York Public Service Commission Case # 17-E-0459, -0460	Pace Energy and Climate Center
Jan. 16, 2018	Great Plains Energy, Inc. Merger with Westar Energy, Inc.	Missouri Public Service Commission Case # EM-2018-0012	Renew Missouri Advocates
Jan. 19, 2018	U.S. House of Representatives, Energy and Commerce Committee	Hearing on "The PURPA Modernization Act of 2017," H.R. 4476	Rábago Energy LLC
Jan. 29, 2018	Joint Petition of Electric Distribution Companies for Approval of a Model SMART Tariff	Massachusetts Department of Public Utilities Case No. 17-140	Boston Community Capital Solar Energy Advantage Inc. (Jointly authored with Sheryl Musgrove)

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Feb. 21, 2018	Joint Petition of Electric Distribution Companies for Approval of a Model SMART Tariff	Massachusetts Department of Public Utilities Case No. 17-140 - Surrebuttal	Boston Community Capital Solar Energy Advantage Inc. (Jointly authored with Sheryl Musgrove)
Apr. 6, 2018	Narragansett Electric Co., d/b/a National Grid Rate Case Filing	Rhode Island Public Utilities Commission Docket No. 4770	New Energy Rhode Island ("NERI")
Apr. 25, 2018	Narragansett Electric Co., d/b/a National Grid Power Sector Transformation Plan	Rhode Island Public Utilities Commission Docket No. 4780	New Energy Rhode Island ("NERI")
Apr. 26, 2018	U.S. EPA Proposed Repeal of Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units, 82 Fed. Reg. 48,035 (Oct. 16, 2017) – "Clean Power Plan"	U.S. Environmental Protection Agency Docket No. EPA-HQ-OAR-2016-0592	Karl R. Rábago
May 25, 2018	Orange & Rockland Utilities, Inc. Rate Case Filing	New York Public Service Commission Case Nos. 18-E-0067, 18-G-0068	Pace Energy and Climate Center
Jun. 15, 2018	Orange & Rockland Utilities, Inc. Rate Case Filing	New York Public Service Commission Case Nos. 18-E-0067, 18-G-0068 – Rebuttal Testimony	Pace Energy and Climate Center
Aug. 10, 2018	Dominion Virginia Electric Power 2018 IRP	Virginia State Corporation Commission Case # PUR-2018-00065	Environmental Respondents
Sep. 20, 2018	Consumers Energy Company Rate Case	Michigan Public Service Commission Case No. U-20134	Environmental Law & Policy Center
Sep. 27, 2018	Potomac Electric Power Co. Notice to Construct Two 230 kV Underground Circuits	District of Columbia Public Service Commission Formal Case No. 1144	Solar United Neighbors of D.C.
Sep. 28, 2019	Arkansas Public Service Commission Investigation of Policies Related to Distributed Energy Resources	Arkansas Public Service Commission Docket No. 16-028-U	Arkansas Audubon Society & Arkansas Advanced Energy Association
Nov. 7, 2018	DTE Detroit Edison Rate Case	Michigan Public Service Commission Case No. U-20162	Natural Resources Defense Council, Michigan Environmental Council, Sierra Club
Mar. 26, 2019	Guam Power Authority Petition to Modify Net Metering	Guam Public Utilities Commission Docket GPA 19-04	Micronesia Renewable Energy, Inc.

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Apr. 4, 2019	Community Power Network & League of Women Voters of Florida v. JEA	Circuit Court Duval County of Florida Case No. 2018-CA-002497 Div: CV-D	Earthjustice
Apr. 16, 2019	Dominion Virginia Electric Power 2018 IRP – Compliance Filing	Virginia State Corporation Commission Case # PUR-2018-00065	Environmental Respondents
Apr. 25, 2019	Georgia Power 2019 IRP	Georgia Public Service Commission Docket No. 42310	GSEA & GSEIA
May 10, 2019	NV Energy NV GreenEnergy 2.0 Rider	Nevada Public Utilities Commission Docket Nos. 18-11015, 18-11016	Vote Solar
May 24, 2019	Consolidated Edison of New York Electric and Gas Rate Cases – Misc. Issues	New York Public Service Commission Case Nos. 19-E-0065, 19-G-0066	Pace Energy and Climate Center
May 24, 2019	Consolidated Edison of New York Electric and Gas Rate Cases – Low- and Moderate-Income Panel	New York Public Service Commission Case Nos. 19-E-0065, 19-G-0066	Pace Energy and Climate Center
May 30, 2019	Connecticut DEEP Shared Clean Energy Facility Program Proposal	Connecticut Department of Energy and Environmental Protection Docket No. 19-07-01	Connecticut Fund for the Environment
Jun. 3, 2019	New Orleans City Council Rulemaking to Establish Renewable Portfolio Standards	New Orleans City Council Docket No. UD-19-01	National Audubon Society and Audubon Louisiana
Jun. 14, 2019	Consolidated Edison of New York Electric and Gas Rate Cases – Rebuttal Testimony	New York Public Service Commission Case Nos. 19-E-0065, 19-G-0066	Pace Energy and Climate Center
Jun. 24, 2019	Program to Encourage Clean Energy in Westchester County Pursuant to Public Service law Section 74-a; Staff Investigation into a Moratorium on New Natural Gas Services in the Consolidated Edison Company of New York, Inc. Service Territory	New York Public Service Commission Case Nos. 19-M-0265, 19-G-0080	Earthjustice and Pace Energy and Climate Center
Jul. 12, 2019	Application of Virginia Electric and Power Company for the Determination of the Fair Rate of Return on Common Equity	Virginia State Corporation Commission Case # PUR-2019-00050	Virginia Poverty Law Center
Jul. 15, 2019	New Orleans City Council Rulemaking to Establish Renewable Portfolio Standards – Reply Comments	New Orleans City Council Docket No. UD-19-01	National Audubon Society and Audubon Louisiana

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Aug. 1, 2019	Interstate Power and Light Company – General Rate Case	Iowa Utilities Board Docket No. RPU-2019-0001	Environmental Law & Policy Center and Iowa Environmental Council
Aug. 19, 2019	Consolidated Edison of New York Electric and Gas Rate Cases – Surrebuttal	New York Public Service Commission Case Nos. 19-E-0065, 19-G-0066	Pace Energy and Climate Center
Aug. 21, 2019	Connecticut Department of Energy and Environmental Protection and Public Utility Regulatory Authority Joint Proceeding on the Value of Distributed Energy Resources - Comments	Connecticut Department of Energy and Environmental Protection/Public Utility Regulatory Authority Docket No. 19-06-29	Connecticut Fund for the Environment and Save Our Sound
Sep. 10, 2019	Interstate Power and Light Company – General Rate Case - Rebuttal	Iowa Utilities Board Docket No. RPU-2019-0001	Environmental Law & Policy Center and Iowa Environmental Council
Sep. 18, 2019	Connecticut Department of Energy and Environmental Protection and Public Utility Regulatory Authority Joint Proceeding on the Value of Distributed Energy Resources – Comments and Response to Draft Study Outline	Connecticut Department of Energy and Environmental Protection/Public Utility Regulatory Authority Docket No. 19-06-29	Connecticut Fund for the Environment, Save Our Sound, E4theFuture, NE Clean Energy Council, NE Energy Efficiency Partnership, and Acadia Center
Sep. 20, 2019	Connecticut Department of Energy and Environmental Protection and Public Utility Regulatory Authority Joint Proceeding on the Value of Distributed Energy Resources – Participation in Technical Workshop 1	Connecticut Department of Energy and Environmental Protection/Public Utility Regulatory Authority Docket No. 19-06-29 http://www.ctn.state.ct.us/ctnplayer.asp?odID=16715	Connecticut Fund for the Environment and Save Our Sound
Oct. 4, 2019	Connecticut Department of Energy and Environmental Protection and Public Utility Regulatory Authority Joint Proceeding on the Value of Distributed Energy Resources – Participation in Technical Workshop 2	Connecticut Department of Energy and Environmental Protection/Public Utility Regulatory Authority Docket No. 19-06-29 http://www.ctn.state.ct.us/ctnplayer.asp?odID=16766	Connecticut Fund for the Environment and Save Our Sound
Oct. 15, 2019	Electronic Consideration of the Implementation of the Net Metering Act (KY SB 100)	Kentucky Public Service Commission Case No. 2019-00256	Kentuckians for the Commonwealth & Mountain Association for Community Economic Development

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Oct. 15, 2019	New Orleans City Council Rulemaking to Establish Renewable Portfolio Standards – Comments on City Council Utility Advisors’ Report	New Orleans City Council Docket No. UD-19-01	National Audubon Society and Audubon Louisiana, Vote Solar, 350 New Orleans, Alliance for Clean Energy, PosiGen, and Sierra Club
Oct. 17, 2019	Indiana Michigan Power Co. General Rate Case	Michigan Public Service Company Case No. U-20359	Environmental Law & Policy Center, The Ecology Center, the Solar Energy Industries Association, and Vote Solar
Dec. 4, 2019	Alabama Power Company Petition for Certificate of Convenience and Necessity	Alabama Public Service Commission Docket No. 32953	Energy Alabama and Gasp, Inc.
Dec. 5, 2019	In the Matter of Net Metering and the Implementation of Act 827 of 2015	Arkansas Public Service Commission Docket No. 16-027-R	National Audubon Society and Arkansas Advanced Energy Association
Dec. 6, 2019	Proposed Revisions to Vermont Public Utility Commission Rule 5.100	Vermont Public Utility Commission Case No. 19-0855-RULE	Renewable Energy Vermont (“REV”)
Jan. 15, 2020	Puget Sound Energy General Rate Case	Washington Utilities and Transportation Commission Docket Nos. UE-190529 & UG-190530	Puget Sound Energy
Feb. 11, 2020	Application of Entergy Arkansas, LLC for a Proposed Tariff Amendment: Solar Energy Purchase Option – Direct Testimony	Arkansas Public Service Commission Docket No. 19-042-TF	Arkansas Advanced Energy Association
Mar. 17, 2020	Application of Entergy Arkansas, LLC for a Proposed Tariff Amendment: Solar Energy Purchase Option – Surrebuttal Testimony	Arkansas Public Service Commission Docket No. 19-042-TF	Arkansas Advanced Energy Association
Jun. 16, 2020	PECO Energy Default Supply Plan V – Direct Testimony	Pennsylvania Public Utility Commission Docket No. P-2020-3019290	Environmental Respondents / Earthjustice
Jun. 24, 2020	Consumers Energy Company General Rate Case – Direct Testimony	Michigan Public Service Commission Case No. U-20697	Joint Clean Energy Organizations / Environmental Law & Policy Center
Jul. 14, 2020	Consumers Energy Company General Rate Case – Rebuttal Testimony	Michigan Public Service Commission Case No. U-20697	Joint Clean Energy Organizations / Environmental Law & Policy Center
Jul. 23, 2020	PECO Energy Default Supply Plan V – Surrebuttal Testimony	Pennsylvania Public Utility Commission Docket No. P-2020-3019290	Environmental Stakeholders / Earthjustice

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Sep. 15, 2020	Dominion Virginia Electric Power 2020 IRP – Direct Testimony	Virginia State Corporation Commission Case # PUR-2020-00035	Environmental Respondents
Sep. 18, 2020	Avoided Cost Proceeding for Georgia Power – Direct Testimony	Georgia Public Service Commission Docket No. 4822	Georgia Solar Energy Industries Association, Inc.
Sep. 29, 2020	Madison Gas and Electric – General Rate Case – Affidavit in Opposition to Electric Rates Settlement	Wisconsin Public Service Commission Docket No. 3270-UR-123	Sierra Club
Sep. 30, 2020	Madison Gas and Electric – General Rate Case – Gas Rates	Wisconsin Public Service Commission Docket No. 3270-UR-123	Sierra Club
Oct. 2, 2020	Duke Energy Florida Petition for Approval of Clean Energy Connect Program	Florida Public Service Commission Docket No. 20200176-EI	League of United Latin American Citizens of Florida
Oct. 2, 2020	Ameren Illinois – Investigation re: Calculation of Distributed Generation Rebates	Illinois Commerce Commission Docket No. 20-0389	Joint Solar Parties
Dec. 9, 2020	Arkansas – In the Matter of a Rulemaking to Adopt an Evaluation, Measurement, and Verification Protocol and Propose M&V Amendments to the Commission’s Rules for Conservation and Energy Efficiency Programs; In the Matter of the Continuation, Expansion, and Enhancement of Public Utility Energy Efficiency Programs in Arkansas	Arkansas Public Service Commission Docket Nos. 10-100-R, 13-002-U	Arkansas Advanced Energy Association
Dec. 22, 2020	Appalachian Power Company 2020 Virginia Clean Economy Act Compliance Plan	Virginia State Corporation Commission Case No. PUR-2020-00135	Environmental Respondent
Jan. 4, 2021	Dominion Virginia Electric Power Company Clean Economy Compliance Plan	Virginia State Corporation Commission Case No. PUR-2020-00134	Environmental Respondent
Feb. 5, 2021	Ameren Illinois – Investigation re: Calculation of Distributed Generation Rebates - Rebuttal	Illinois Commerce Commission Docket No. 20-0389	Joint Solar Parties
Feb. 15, 2021	Kentucky Power Company General Rate Case	Kentucky Public Service Commission Case No. 2020-00174	Joint Intervenor – Mountain Association, Kentuckians for the Commonwealth, Kentucky Solar Energy Society

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Mar. 2, 2021	Dominion Virginia Electric Power Company Rider RGGI Proposal	Virginia State Corporation Commission Case No. PUR-2020-00169	Environmental Respondent
Mar. 5, 2021	Kentucky Utilities Company and Louisville Gas and Electric Company General Rate Cases	Kentucky Public Service Commission Case Nos. 2020-00349, 2020-00350	Joint Intervenors – Mountain Association, Kentuckians for the Commonwealth, Kentucky Solar Energy Society
Apr. 5, 2021	Docket to Review the Efficacy and Fairness of the Net Metering and Interconnection Rules – Comments	Mississippi Public Service Commission Docket No. 2021-AD-19	Entegriy Energy Partners, LLC & Audubon Delta / National Audubon Society
Apr. 13, 2021	Petition of Guam Power Authority for Creation of a New Energy Storage Rate – Comments of Micronesia Renewable Energy, Inc.	Guam Public Utilities Commission Docket No. 20-09	Micronesia Renewable Energy, Inc.
May 25, 2021	Petition of Episcopal Diocese of Rhode Island for Declaratory Judgment on Transmission System Costs and Related “Affected System Operator” Studies	Rhode Island Public Utility Commission Docket No. 4981	Episcopal Diocese of Rhode Island
Jun. 21, 2021	Petition for Rate Increase by Florida Power & Light Company – Direct Testimony	Florida Public Service Commission Docket No. 20210015-EI	Florida Rising, Inc., League of United Latin American Citizens of Florida, and Environmental Confederation of Southwest Florida, Inc.
Jun. 22, 2021	Application of Consumers Energy Company for Authority to Increase Its Rates for the Generation and Distribution of Electricity and Other Relief	Michigan Public Service Commission Case No. U-20963	The Environmental Law and Policy Center (EPLC)
Jun. 28, 2021	Pennsylvania Public Utility Commission v. PECO Energy Company (GRC)	Pennsylvania Utility Commission Docket No. R-2021-3024601	Clean Energy Advocates
Jul. 12, 2021	Application of Consumers Energy Company for Authority to Increase Its Rates for the Generation and Distribution of Electricity and Other Relief – Rebuttal	Michigan Public Service Commission Case No. U-20963	The Environmental Law and Policy Center (EPLC)
Jul. 28, 2021	Application of Shenandoah Valley Electric Cooperative for a General Increase in Rates	Virginia State Corporation Commission Case No. PUR-2021-00054	Solar United Neighbors of Virginia (SUN-VA)
Aug. 5, 2021	Kentucky Utilities Company and Louisville Gas and Electric Company General Rate Cases – Supp. Proceeding on Net Energy Metering	Kentucky Public Service Commission Case Nos. 2020-00349, 2020-00350	Joint Intervenors – Mountain Association, Kentuckians for the Commonwealth, Kentucky Solar Energy Society

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Sep. 2, 2021	Madison Gas & Electric Co. – General Rate Case	Wisconsin Public Service Commission Docket No. 3270-UR-124	Sierra Club
Sep. 3, 2021	Dominion Virginia Electric Power Company – Triennial Rate Review – Direct Testimony on ROE	Virginia State Corporation Commission Case No. PUR-2020-00169	
Sep. 13, 2021	Petition for Rate Increase by Florida Power & Light Company – Settlement Testimony	Florida Public Service Commission Docket No. 20210015-EI	Florida Rising, Inc., League of United Latin American Citizens of Florida, and Environmental Confederation of Southwest Florida, Inc.
Sep. 20, 2021	Madison Gas & Electric Co. – General Rate Case – Surrebuttal Testimony	Wisconsin Public Service Commission Docket No. 3270-UR-124	Sierra Club
Sep. 27, 2021	Dakota Energy Cooperative, Inc. v. East River Electric Power Cooperative, Inc. and Basin Electric Power Cooperative – Expert Report	US. District Court, District of South Dakota (Southern Division) Case 4:20-CV-04192-LLP	Dakota Energy Cooperative, Inc.
Oct. 5, 2021	In the Matter of establishing regulations for a shared solar program pursuant to § 56-594.3 of the Code of Virginia	Virginia State Corporation Commission Case No. PUR-2020-00125	Coalition for Community Solar Access
Nov. 1, 2021	Dakota Energy Cooperative, Inc. v. East River Electric Power Cooperative, Inc. and Basin Electric Power Cooperative – Surrebuttal Expert Report	US. District Court, District of South Dakota (Southern Division) Case 4:20-CV-04192-LLP	Dakota Energy Cooperative, Inc.
Nov. 16, 2021	Petition of Virginia Electric and Power Company for approval of the RPS Development Plan, approval & certification of proposed CE-2 Solar Projects pursuant to § 56-580 D and 56-46.1 of the Code of Virginia	Virginia State Corporation Commission Case No. PUR-2021-00146	Appalachian Voices
Mar. 1, 2022	In the Matter of establishing regulations for a multi-family shared solar program pursuant to § 56-585.1:12 of the Code of Virginia	Virginia State Corporation Commission Case No. PUR-2020-00125	Appalachian Voices

Testimony Submitted by Karl R. Rábago**(as of 19 December 2022)**

Mar. 29, 2022	Review of Duke Energy Carolina, LLC & Duke Energy Progress, LLC Joint Application for Approval of NEM Tariff Revisions and Recommendations for Investigation of Costs and Benefits of Customer-Sited Generation – Expert Report	North Carolina Utilities Commission Docket No. E-100, Sub. 180	Environmental Working Group
Mar. 30, 2022	Ameren Illinois Company Petition for Approval of Performance and Tracking Metrics Pursuant to 220 ILCS 5/16-108.188(e) – Direct Testimony	Illinois Commerce Commission Docket No. 22-0063	Joint Solar Parties
Apr. 6, 2022	Commonwealth Edison Company Petition for the Establishment of Performance Metrics under Section 16-108.18(e) of the Public Utilities Act	Illinois Commerce Commission Docket No. 22-0067	Joint Solar Parties
May 6, 2022	Review of Duke Energy Carolina, LLC & Duke Energy Progress, LLC Joint Application for Approval of NEM Tariff Revisions and Recommendations for Investigation of Costs and Benefits of Customer-Sited Generation – Reply Report	North Carolina Utilities Commission Docket No. E-100, Sub. 180	Environmental Working Group
May 25, 2022	Ameren Illinois Company Petition for Approval of Performance and Tracking Metrics Pursuant to 220 ILCS 5/16-108.188(e) – Rebuttal Testimony	Illinois Commerce Commission Docket No. 22-0063	Joint Solar Parties
May 27, 2022	Review of Duke Energy Carolina, LLC & Duke Energy Progress, LLC Joint Application for Approval of NEM Tariff Revisions and Recommendations for Investigation of Costs and Benefits of Customer-Sited Generation – Surreply Report	North Carolina Utilities Commission Docket No. E-100, Sub. 180	Environmental Working Group

Testimony Submitted by Karl R. Rábago**(as of 19 December 2022)**

Jun. 6, 2022	Commonwealth Edison Company Petition for the Establishment of Performance Metrics under Section 16-108.18(e) of the Public Utilities Act – Rebuttal Testimony	Illinois Commerce Commission Docket No. 22-0063	Joint Solar Parties
Jun. 22, 2022	In the Matter of Austin Energy Base Rate Case Filing Dated April 18, 2022	City of Austin Hearing Examiner	Sierra Club, Public Citizen, and Solar United Neighbors
Oct. 3, 2022	In the Matter of the Application of Northern States Power Company for Authority to Increase Rates for Electric Service in Minnesota	Minnesota Public Utilities Commission Docket No. E002/GR-21-630.	Just Solar Coalition
Oct. 13, 2022	Verified Petition of Vote Solar of Distributed Energy Resource Systems in Wisconsin – Rebuttal	Wisconsin PSC Docket No. 9300-DR-106	Vote Solar
Oct. 21, 2022	Verified Petition of Vote Solar of Distributed Energy Resource Systems in Wisconsin - Surrebuttal	Wisconsin PSC Docket No. 9300-DR-106	Vote Solar
Nov. 14, 2022	In the Matter of the Application of Columbia Gas of Ohio, Inc. for Authority to Amend its Filed Tariffs to Increase the Rates and Charges for Gas Services and Related Matters	Public Utilities Commission of Ohio Case No. 21-637-GA-AIR	Environmental Law & Policy Center
Dec. 6, 2022	In the Matter of the Application of Northern States Power Company for Authority to Increase Rates for Electric Service in Minnesota - Surrebuttal	Minnesota Public Utilities Commission Docket No. E002/GR-21-630.	Just Solar Coalition
Dec. 19, 2022	Application of NorthWestern Energy for Authority to Increase Retail Electric and Natural Gas Utility Service Rates - Direct	Montana Public Service Commission Docket No. 2022.07.078	Montana Environmental Information Center (MEIC), Earthjustice

EXHIBIT KRR-3: Company Response to ARISEIA/SEIA Second Data Request

**TUCSON ELECTRIC POWER COMPANY'S RESPONSE TO
ARISEIA and SEIA SECOND SET OF DATA REQUESTS
2022 TUCSON ELECTRIC POWER RATE CASE
DOCKET NO. E-01933A-22-0107
December 19, 2022**

ARISEIA 2.1

Regarding the R-TECH tariff, please provide on a monthly basis from 1/1/21 to the latest available data:

- a. The number of customers taking service on this tariff,
- b. For each customer taking service on the rate, a list of which primary and secondary technologies are in use.
- c. If fewer than 0.01% of customers are taking service on it after the initial 18 months, was a report filed with the Commission within 90-days? If yes, please provide the report. If not, please explain why it has not been filed.

RESPONSE:

- a. No customers have taken service on the R-TECH tariff since 1/1/21.
- b. Not applicable.
- c. No report was filed. TEP will file a report with the Commission on the status of the R-TECH tariff.

RESPONDENT:

Richard Bachmeier

WITNESS:

Richard Bachmeier

**TUCSON ELECTRIC POWER COMPANY'S RESPONSE TO
ARISEIA and SEIA SECOND SET OF DATA REQUESTS
2022 TUCSON ELECTRIC POWER RATE CASE
DOCKET NO. E-01933A-22-0107
December 19, 2022**

ARISEIA 2.2

The R-TECH tariff appears to require that customers enrolling on the rate purchase and install the primary qualifying technology within 90 days of enrolling in the pilot.

- a. Please confirm that customers with existing qualifying primary technologies are not eligible for this rate. If deny, please explain how the 90-day period is implemented.
- b. Have customers that have expressed interest in the pilot complained about the 90-day purchase limitation?
- c. What is the policy justification for limiting this tariff to customers who purchased new primary technologies rather than allowing customers with existing primary technologies to participate?

RESPONSE:

- a. Yes, the pilot requires purchase and installation of qualifying technologies within 90 days of enrolling in the pilot. The Company has no record of customers contacting TEP Customer Service to express interest in the R-TECH pilot, so the 90-day period has never been implemented.
- b. The Company has no record of customers contacting TEP Customer Service to express interest in the R-TECH pilot.
- c. TEP was ordered to implement the R-TECH tariff in Decision No. 76899. In Finding of Fact No. 28 of that Decision, the Commission stated:

It is reasonable to direct TEP to submit a tariff designed to encourage residential customers to install behind the meter technology that would assist them to reduce their demand are reasonable [sic]. It is reasonable to direct TEP to file with Docket Control, as a compliance item in this docket, a proposed R-Tech-like tariff for Staff and the parties to review, within 120 days of the effective date of this Decision. (Decision No. 76899, 112:9-13)

TEP interprets the language "to encourage residential customers to install" as giving customers incentives to install technology that did not exist previously. The Commission approved TEP's R-TECH tariff submitted in compliance with Decision No. 76899.

RESPONDENT:

Richard Bachmeier

WITNESS:

Richard Bachmeier

**TUCSON ELECTRIC POWER COMPANY'S RESPONSE TO
ARISEIA and SEIA SECOND SET OF DATA REQUESTS
2022 TUCSON ELECTRIC POWER RATE CASE
DOCKET NO. E-01933A-22-0107
December 19, 2022**

ARISEIA 2.3

Return on Equity and Rate of Return:

- a. Please quantify the impact of a one basis point change (0.01%), e.g., from 10.25% to 10.24% in the allowed ROE under the Company's rate application proposal on: (a) total revenue requirement, (b) revenue requirement by customer class, (c) proposed rates for residential and small commercial customers, and (d) total rate of return under proposed cost of debt.
- b. Please quantify the impact of a one basis point change (0.01%), e.g., from 50.00% to 50.01% in the share of equity versus debt (equity ratio) on: (a) total revenue requirement, (b) revenue requirement by customer class, (c) proposed rates for residential and small commercial customers, and (d) total rate of return under proposed cost of debt.

RESPONSE:

- a. Impact of a one basis point change (0.01%), e.g., from 10.25% to 10.24% in the allowed ROE under the Company's rate application proposal on:
 - (a) total revenue requirement: reduction of approximately \$263,000.
 - (b) revenue requirement by customer class, (c) proposed rates for residential and small commercial customers:

TEP objects to subparts (b) and (c) of this request because they require the production of scenario analyses that do not currently exist. The Company has filed all relevant workpapers for ARISEIA to perform the analyses requested. However, without waiver of objection, the change in total revenue requirement is approximately -0.0951% and the impacts on proposed rates for residential and small commercial customers will likely be comparable to that change.

(d) total rate of return under proposed cost of debt: reduced from 7.3132% to 7.3078%.

- b. Impact of a one basis point change (0.01%), e.g., from 50.00% to 50.01% in the share of equity versus debt (equity ratio) on:
 - (a) total revenue requirement: increase of approximately \$36,000.
 - (b) revenue requirement by customer class, (c) proposed rates for residential and small commercial customers:

TEP objects to subparts (b) and (c) of this request because they require the production of scenario analyses that do not currently exist. The Company has filed all relevant workpapers for ARISEIA to perform the analyses requested. However, without waiver of objection, the change in total revenue requirement is approximately 0.0129% and the impacts on proposed rates for residential and small commercial customers will likely be comparable to that change.

(d) total rate of return under proposed cost of debt: increased from 7.3132% to 7.3139%.

RESPONDENT:

Richard Bachmeier/Rigo Ramirez

WITNESS:

Richard Bachmeier

**TUCSON ELECTRIC POWER COMPANY'S RESPONSE TO
ARISEIA and SEIA SECOND SET OF DATA REQUESTS
2022 TUCSON ELECTRIC POWER RATE CASE
DOCKET NO. E-01933A-22-0107
December 19, 2022**

ARISEIA 2.4

Basic Service Charge:

- a. Please provide a detailed breakdown of all costs, by type and amount, classified as customer costs and/or allocated to the basic service charge proposed by the Company. Please include references to all cost of service values underlying the proposed rates. Please provide responses in or with reference to Excel spreadsheets with cells unlocked and formulas intact.

RESPONSE:

Please refer to the "G-6-1 Unit Cost Proposed" tab in the "2021 TEP COSS" file for the total costs allocated to the customer component. Please refer to the "G-7 Allocations" tab in the "2021 TEP COSS" file for allocation details for how the different costs were allocated to the customer component. Please refer to "Schedule G-3" and "Schedule G-4" from the "2021 TEP COSS" file for a detailed breakout of how the different FERC costs were allocated to the different classes.

RESPONDENT:

Jared Dang

WITNESS:

Jared Dang

**TUCSON ELECTRIC POWER COMPANY'S RESPONSE TO
ARISEIA and SEIA SECOND SET OF DATA REQUESTS
2022 TUCSON ELECTRIC POWER RATE CASE
DOCKET NO. E-01933A-22-0107
December 19, 2022**

ARISEIA 2.5

Distributed Non-Utility Solar Generation:

- a. Please provide any value of solar or benefit-cost assessment analyses conducted by or relied upon or referred to by the Company in quantifying the impact of non-utility solar generation operating on the Company's system.
- b. Please indicate whether the Company has performed or commissioned any analysis of the costs or benefits of distributed non-utility solar generation operating as part of a shared or community solar program operating in parallel to the Company's system. Please provide copies of all such analysis and results. If the Company has not performed or commissioned such an analysis, please explain why it did not.
- c. Please indicate whether the Company has developed any modeling of shared or community solar generation. Please provide copies of all such models and results. If the Company has not performed or commissioned such modeling, please explain why it did not.
- d. Please indicate whether the Company has evaluated shared or community solar program structures, and whether the Company has developed a view on the best design and elements for shared or community solar programs. Please provide copies of all relevant modeling, analysis, program structures evaluated, evaluations, and other references or materials relating to shared or community solar that the Company has in its possession.

RESPONSE:

For items a-d:

While the Company has not performed detailed analyses as specified in these data requests the Company has identified concerns and potential impact as indicated in its comments filed in Docket No. E-00000A-22-0103:

<https://docket.images.azcc.gov/E000021300.pdf?i=1670543153841>

<https://docket.images.azcc.gov/E000021879.pdf?i=1670543153841>

RESPONDENT:

Karen Kansfield

WITNESS:

Dallas Dukes